DOCUMENT RESUME

ED 207 705 PS 012 425

AUTHOR Roe, Kiki V.; And Others
TITLE Infants' Mother-Stranger Discrimination and Cognitive Functioning Twelve Years Later.
PUB DATE Sep 80
NOTE 6p.; Paper presented at the Annual Meeting of the American Psychological Association (Montreal, Canada, September 1980).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cognitive Ability; *Infant Behavior; *Interpersonal Competence; Longitudinal Studies; Males; Nonverbal Ability; *Parent Child Relationship; Predictor Variables; Stranger Reactions; *Verbal Development
IDENTIFIERS *Vocalization

ABSTRACT

Differences in 3-month-old infants' vocal responsiveness to vocal-visual stimulation by mothers and strangers has been shown to be related to performance on both the Stanford-Binet at 3 years of age and the Illinois Test of Psycholinguistics at 5 years of age. The present retesting of 12 of the original 14 normal, first-born male subjects, now 12 years old, shows that their differential vocal responsiveness (DVR) scores at 3 months of age are related significantly to performance on such linguistic-academic tests as the Wechsler Intelligence Scale for Children-Revised (WISC-R) verbal scale, the Wide Range Achievement Test (WRAT) Arithmetic and Reading subtests, and the Peabody Picture Vocabulary Test (PPVT), but are not related to performance on such non-verbal tests as the WISC-R Performance scale. It is concluded that the social discrimination ability of the infant, that is, the perceptual-cognitive ability to respond with excitement to the mother and to withhold responsiveness to the stranger, is of predictive value for later verbal-cognitive functioning. In contrast, the subjects' performance on the Gesell, a test that measures early psychomotor skills, did not correlate with later verbal-cognitive and academic skills, but did correlate significantly with non-verbal cognitive skills. (Author/RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Kiki V. Roe
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

INFANTS' MOTHER-STRANGER DISCRIMINATION AND COGNITIVE FUNCTIONING TWELVE YEARS LATER

Roe, Kiki V., & McClure, Anne, University of California, Los Angeles
Roe, Arnold, California State University, Northridge

ED207705

The importance of the early mother-stranger interaction on the subsequent development of the personality and emotional functioning of the child has long been recognized. Now we are beginning to get evidence that the early mother-infant interaction is also important in the subsequent cognitive development of the child.

My own work has shown that infants can discriminate their mother from a stranger as early as three months of life, and that this 3-month phenomenon consistently correlates with subsequent verbal-cognitive and academic functioning up to at least 12 years of age.

The infants I first studied 13 years ago were normal, first-born males from English speaking homes where the mother was the principal caretaker. All parents had at least high school education and lived in a suburban, middle class area in Los Angeles. Initially, there were 14 infants, 12 of whom have been available for retesting over the 12-year period.

When I started this study, my main objective was to obtain normative data on how much infants vocalize, both under naturalistic and stimulating conditions and to explore the meaning of individual differences in vocal output during the first 15 months of life.

PS 012425

Paper presented at the annual meeting of the American Psychological Association, Montreal, September, 1980.

I first visited the babies in their homes when they were three months old. The subject was placed in an infant seat and his mother talked to him for three minutes from a distance of about 3 feet. The mother was instructed that the purpose of this was to try to elicit from the baby as many vocalizations as possible. Thus, she was sensitized to stop talking and wait whenever she thought the baby was getting ready to vocalize, such as when he was opening his mouth or forming his lips. After the mother-infant interaction, the baby was allowed to rest for four minutes and afterwards, I similarly talked to him for three minutes.

All vocalizations were recorded and afterwards, the baby's vocalizations were evaluated by independent observers to determine the amount of time each subject spent in neutral or non-distress vocalizations under each condition. Each subject was then assigned a differential vocal responsiveness (DVR). For example, if baby X, in response to stimulation by mother, vocalized for 78 seconds and in response to stimulation by the stranger vocalized for 6 seconds, subtracting the 6 seconds from the 78 seconds, we get DVR of plus 72 seconds. This would be a high discriminating baby. On the other hand, if baby Y vocalized only for 12 seconds in response to the mother and for 18 seconds in response to the stranger, this baby would get a minus 6 second DVR, placing him in the category of low or no discrimination. Depending on the magnitude of the individual subjects' DVR, half of the subjects were classified as high discriminators and the other half as low discriminators.

The subjects' spontaneous vocalizations as well as their mothers' vocalizations to them were also recorded during two sixty-minute naturalistic observations. The subjects' neutral vocalizations during these

observations were used as a base rate or unstimulated base rate of vocalization.

It was found that the high discriminators responded with significantly higher than base rate vocal output in response to stimulation by their mother, whereas they responded with significantly lower than base rate vocalizations in response to stimulation by the stranger; that is, high discriminators increased their vocal responsiveness to the mother and inhibited such responsiveness to the stranger, while the low discriminators vocalized about the same amount as base rate in response both to the mother and the stranger.

When the subjects were 3 years old, they were given the Stanford-Binet test and when they were 5 years old, they were given the Illinois Test of Psycholinguistic Abilities (ITPA) by an independent experimenter who had no idea of the subjects' prior scores. The high discriminating subjects at 3 months performed significantly better on both tests. For example, the high discriminators had Stanford-Binet scores of 108.4 vs. 98.5 for the low discriminators, and 136.2 versus 122.3 on the ITPA.

These results were very intruiging. For those of you who are not familiar with the ITPA, this is a diagnostic tests made up of subtests that index different cognitive capacities. In order to get a better understanding of the skills that the 3-month old DVR subsequently relates to, we ran Spearman Rank correlations between the early DVR and the subjects' scores on the 10 main subtests of the ITPA. This correlational analysis showed that the early DVR correlated highly with those subtests that measure associative-symbolic and linguistic skills.

In order to verify further the association between the early

discrimination index with specific symbolic-verbal skills, the subjects were recently tested again when they reached 12 years of age, just before entering junior high school. We hypothesized that the early DVR would correlate with those tests that measure mainly verbal-cognitive skills and would show little or no relationship with those tests that measure non-verbal cognitive skills. Also, since academic functioning is generally related to verbal skills, we further hypothesized that the 3-month DVR would also show relationship to academic functioning. A naive experimenter gave the children the Wechsler Intelligence Scale for Children-Revised (WISC-R), the Peabody Picture Vocabulary Test (PPVT), and the Arithmetic and Reading subtests of the Wide Range Achievement Test (WRAT).

The results supported our hypothesis. The early differential vocal responsiveness to mother versus stranger at three months correlates very strongly with the Verbal Intelligence Scale of the WISC-R while it does not correlate with the Performance or non-verbal intelligence scale of the WISC-R. Also, as predicted, it correlates significantly with performance on the PPVT and performance on the Reading and Arithmetic subtests of the WRAT. Considering these results, the question now is why is this early index such a good predictor of later verbal-cognitive abilities? Before I try to give my answer to this question, I would like to add some more data, which, I think, will help clarify the point. Firstly, the subjects' spontaneous vocalizations under non-stimulating conditions did not correlate with subsequent development.

The subjects' vocal responsiveness to the mother alone under stimulating conditions did correlate significantly with many of the subjects' subsequent intelligence scores. However, using the subjects' vocal

responsiveness to both the mother and the stranger results in much sharper correlations with later verbal-cognitive development than the responsiveness to the mother alone. I think it is the social discrimination ability of the infant, this perceptual-cognitive ability, this ability to respond with excitement to the known mother stimulus and the ability to inhibit and withhold responsiveness to the unknown stranger stimulus that is of predictive value for later verbal-cognitive functioning.

For the sake of emphasizing the predictive utility of the early DVR for later verbal-cognitive skills, it is worth mentioning that these infants' performance on the Gesell, a test that measures early psychomotor skills, did not correlate with later verbal-cognitive and academic skills but it did correlate significantly with such non-verbal cognitive skills as those assessed by the WISC-R Performance scale at age 12 years (see Table 1). These results suggest that prediction of later cognitive skills from early infancy may be possible if the behaviors assessed at the two age levels sample similar cognitive content.